BROWN, BRYCE C. 1967. *Eurycea neotenes*. Catalogue of American Amphibans and Reptiles, p. 36.

Eurycea neotenes Bishop and Wright
Texas salamander

Eurycea neotenes Bishop and Wright, 1937:141–143.
Type-locality "Culebra Creek, 5 miles north of Helotes, Bexar County, Texas." Holotype, U.S. Natl. Mus. 103161, a male, collected by S. C. Bishop and M. Wright on 1 April 1936. The name of the creek has been corrected to Helotes Creek (Brown, 1942).

• CONTENT. Two subspecies are recognized, *E. n. neotenes* and *E. n. pterophila.*

• DEFINITION AND DIAGNOSIS. A stout, medium-sized (50 to 100 mm total length) neotenic salamander with short, moderately stout legs, long and slender bright red gill filaments, and narrow tail fins. The coloration is light yellow; the dorsum is mottled with a darker pigment and has a double row of light flecks on each side of the body, though the lower row may be obscured in older individuals. The diameter of the eye is about twice the interorbital distance. Costal grooves number 15 to 17 (typically 16), usually with 5 (sometimes 6 or 7) grooves between the adpressed limbs. There are from 6 to 9 palatopterygoid teeth, and from 11 to 15 (mean, 13) premaxillary teeth.

Eurycea neotenes differs from *E. nana* in its larger size, stouter body, smaller eyes with no dark ring around the lens, larger number of palatopterygoid teeth, and light yellow coloration; from *E. latitans* by its smaller size, shorter limbs, more slender body, lack of an abrupt elevation from the snout, fewer premaxillary teeth, and double lateral rows of light flecks; and from *E. troglodytes* by its shorter limbs, its larger eyes not covered with skin, larger number of costal grooves, fewer premaxillary and palatopterygoid teeth, and double lateral rows of light flecks.

• DESCRIPTIONS. The original description is given by Bishop and Wright (1937). A more detailed description of the adults and a brief description of the eggs were given by Bishop (1943). Baker (1961) provided a good diagnosis of this species. Adequate life histories have not been published.

Eurycea neotenes is a medium-sized neotenic salamander. Individuals with maximum total lengths of 72 mm and snout to vent lengths of 39 mm have been recorded from the type locality (Bishop, 1937), but specimens from other localities tentatively identified as *E. neotenes* have a total length of up to 100 mm. The relatively broad head (widest immediately anteriorly to the gills) has a bluntly rounded snout and eyes of moderate size (diameter about twice the interorbital distance). The three gills have long slender filaments which are bright red in life.

The trunk is slightly compressed, and the oval tail is somewhat flattened below and compressed toward the tip. Both the dorsal and ventral tail fins are very narrow; the dorsal fin extends over most of the tail length while the ventral fin is only on the posterior half. The costal grooves number 15 to 17 with 5 or 6 between adpressed limbs. The short, moderately stout legs have 4 toes on the forefeet (1-4-2-3—order of length, from the shortest) and 5 toes on the hind feet (order of length —1-5-2-4-3).

The ground color in life is light yellow with brown chromatophores that give it a mottled appearance. A double row of light flecks is found on each side of the body, but the lower row usually is only evident in smaller individuals. A fairly prominent dark bar extends from the eye to the nostril. The light yellow lower sides and belly normally are without pigment.

The moderately large fleshy tongue is larval in character. The larval vomeropterygoid teeth follow the lines of the upper jaw and extend posteriorly to the rear edge of the eye. Six to 9 palatopterygoid and 11 to 15 (mean, 13) premaxillary teeth are present.

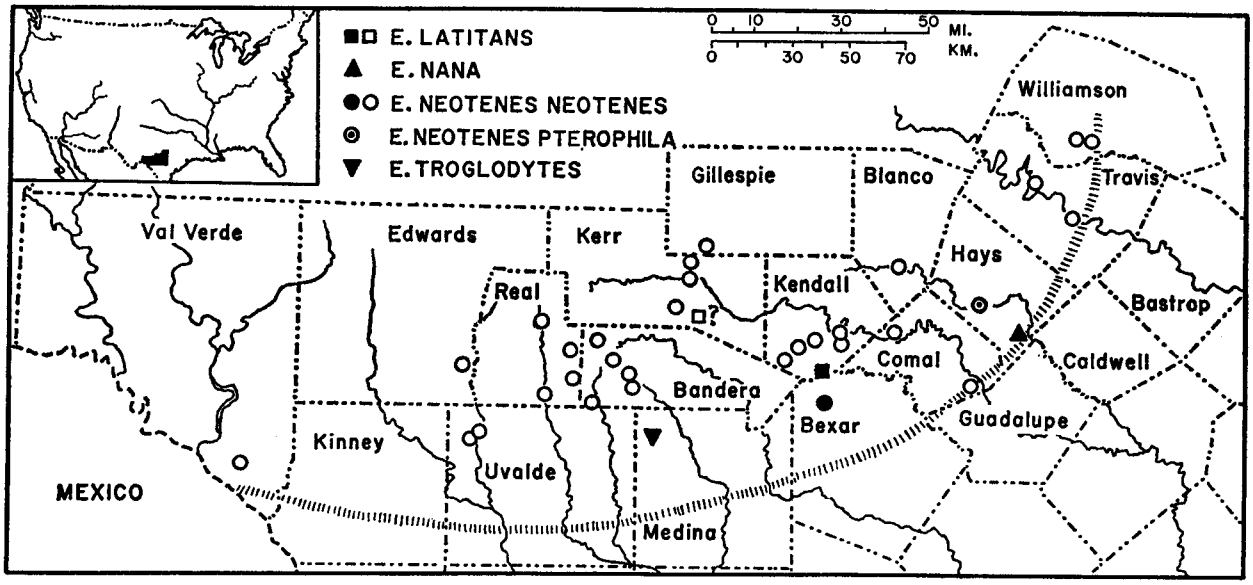
The vent of the female is a simple slit with a few low tubercles along its margin; in the male the margins of the vent are thrown into low folds.

• ILLUSTRATIONS. See Bishop and Wright (1937:142) for a line drawing, Bishop (1943:442) for a photograph, and Conant (1958:270) for a colored photograph. See Mitchell and Reddell (1965) for line drawings. Kezer (1952) provided photographs of *Eurycea neotenes* before and after inducing partial artificial metamorphosis. No illustrations of eggs or larvae have been published.

• DISTRIBUTION. This neotenic salamander is found in the springs, streams, and cave water of the Edwards Plateau region of west central Texas. It has been recorded in the literature from Williamson, Travis, Hays, Comal, Bexar, Medina, Uvalde, Edwards, Real, Bandera, Kendall, Kerr, Gillespie, and Blanco Counties (Brown, 1950 and Baker, 1961). Some of these records may represent populations of undescribed neotenic euryceas.

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. Very little has been published on this species. Baker (1961) provided a key and distributional



MAP. Distribution of neotenic species of *Eurycea* on the Edwards Plateau of Texas. Hatching marks the approximate edge of the Plateau. Open symbols indicate localities other than type-localities. *E. neotenes* is widespread in the region.

data. Additional morphological data on *E. neotenes* are in his description of *E. troglodytes* (1957). Kezer (1952) reported on thyroxin-induced partial metamorphosis in *E. neotenes*. Dundee (1962) also reported on induced metamorphosis. Hunsaker and Potter (1960) noted "Red Leg" disease in the *Eurycea* at Helotes Creek.

• ETYMOLOGY. The name *neotenes* comes from the Greek, *neotes*, meaning youth. This refers to the salamander becoming sexually mature while still in the larval state.

1. *Eurycea neotenes neotenes* Bishop and Wright. Edwards Plateau salamander.

Eurycea neotenes. See species account.
Eurycea neotenes neotenes: Schmidt, 1953:55.

• DEFINITION. *Eurycea n. neotenes* has no posterior basibranchium. The articulation of the last rib is differentiated into a capitulum and tuberculum; the capitulum and tuberculum of the penultimate rib are of equal length.
See also the definition of *Eurycea neotenes*.

• REMARKS. The common name (Bexar County salamander) selected by the ASIH Committee (Conant, *et al.*, 1956) does not seem appropriate for this widespread neotenic salamander. A substitute common name is proposed here.
Many of the populations now assigned to *E. n. neotenes* will probably be shown to be worthy of at least subspecific rank, if not, in some cases, specific rank.

2. *Eurycea neotenes pterophila* Burger, Smith and Potter. Fern Bank salamander.

Eurycea pterophila Burger, Smith, and Potter, 1950:51.
Type-locality, "the shallow stream flowing from Fern Bank Spring, 6.3 miles northeast of Wimberley on the Blanco River road, Hays County, Texas." Holotype, Floyd Potter Coll. No. A 993, collected by Floyd E. Potter, Jr. on 22 May 1946.
Eurycea neotenes pterophila: Schmidt, 1953:56.

• DEFINITION. *Eurycea neotenes pterophila* has a Y-shaped posterior basibranchium. The articulation of the last rib is simple and undivided. The tuberculum of the penultimate rib is one-half the length of the capitulum.
See also definition of *Eurycea neotenes*.

• REMARKS. This subspecies has only been found in Fern Bank Spring, near Wimberley, Hays County, Texas. This form has been regarded as a full species by Blair (1957) and, more recently, by Mitchell and Reddell (1965). Schmidt (1953), without explanation, was the first to include *pterophila* as a subspecies of *neotenes*. Burger, Smith, and Potter (1950), however, pointed out that *E. pterophila* is indistinguishable from *E. neotenes* on the basis of external morphological features.

COMMENT

All the neotenic *Eurycea* of Texas were given specific rank in their original descriptions, but Schmidt (1953) arbitrarily allocated them as subspecies of *E. neotenes*. Conant (1958) followed Schmidt for *E. latitans* and *E. pterophila* but considered *E. nana* and *E. troglodytes* as distinct species. All investigators (Baker, 1961, Brown, 1950, Kezer, 1952, Potter and Rabb, 1960, Smith and Potter, 1946) working directly with these salamanders have agreed, however, they should all (except for *E. neotenes pterophila*) be regarded as distinct species.

LITERATURE CITED

Baker, James K. 1957. *Eurycea troglodytes*: a new blind salamander from Texas. Texas Jour. Sci., 9(3):328–336.
— 1961. Distribution of and key to the neotenic *Eurycea* of Texas. Southwestern Nat., 6(1):27–32.
Bishop, Sherman C. 1943. Handbook of salamanders. Comstock Publ. Co., Ithaca, New York. xiv + 555 pp.
Bishop, Sherman C., and Margaret R. Wright. 1937. A new neotenic salamander from Texas. Proc. Biol. Soc. Washington, 50:141–143.
Blair, A. P. 1957. Amphibians, pp. 211–271. *In* W. F. Blair *et al.*, Vertebrates of the United States. McGraw-Hill Book Co., New York. ix + 819 pp.
Brown, Bryce C. 1942. Notes on *Eurycea neotenes*. Copeia, 1942(3):176.
— 1950. An annotated check list of the reptiles and amphibians of Texas. Baylor Univ. Press, Waco, Texas. 259 pp.
Burger, W. Leslie, Hobart M. Smith, and Floyd E. Potter, Jr. 1950. Another neotenic *Eurycea* from the Edwards Plateau. Proc. Biol. Soc. Washington, 63:51–58.
Conant, Roger. 1958. A field guide to reptiles and amphibians of the United States and Canada east of the 100th meridian. Houghton Mifflin Co., Boston. xviii + 366 pp., 40 pls.
Conant, Roger, *et al.* 1956. Common names for North American amphibians and reptiles. Copeia, 1956(3):172–185.
Dundee, Harold A. 1962. Response of the neotenic salamander *Haideotriton wallacei* to a metamorphic agent. Science, 135(3508):1060–1061.
Hunsaker, Don, II, and Floyd E. Potter, Jr. 1960. "Red Leg" in a natural population of amphibians. Herpetologica, 16(4):285–286.
Kezer, James. 1952. Thyroxin-induced metamorphosis of the neotenic salamanders *Eurycea tynerensis* and *Eurycea neotenes*. Copeia, 1952(4):234–237.
Mitchell, Robert W., and James R. Reddell. 1965. *Eurycea tridentifera*, a new species of troglobitic salamander from Texas and reclassification of *Typhlomolge rathbuni*. Texas Jour. Sci., 17:12–27.
Potter, F., and G. Rabb. 1960. Thyroxin-induced metamorphosis in a neotenic salamander, *Eurycea nana* Bishop. Privately printed as Zoology Series, A. and M. College of Texas, 1(1)1–12.
Schmidt, Karl P. 1953. A check list of North American amphibians and reptiles. Sixth edition. Amer. Soc. Ichthyol. and Herpetol. viii + 280 pp.
Smith, Hobart M., and Floyd E. Potter, Jr. 1946. A third neotenic salamander of the genus *Eurycea* from Texas. Herpetologica, 3(4):105–109.

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